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The Year Round Calendar: An Analysis of Student Outcomes

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Introduction

Almost a decade ago, the National Education Commission on Time and Learning warned Americans that schools were unable to meet the demands of a new global economy. For 150 years, schools had operated on schedules that suited only the top students, while average and poor students simply dropped out to make decent livings on farms or in factories. However, the days when most non-skilled or semi-skilled workers could find productive work are over:

> The reality of today's world is that the global economy provides few decent jobs for the poorly educated. Today, a new standard for an educated citizenry is required, a standard suited to the 21st century, not the 19th or the 20th. Americans must be as knowledgeable, competent, and inventive as any people in the world. All of our citizens, not just a few, must be able to think for a living. Indeed, our students should do more than meet the standard; they should set it. The stakes are very high. Our people not only have to survive amidst today's changes, they have to be able to create tomorrow's.[1]

Therefore, given that students learn at different rates and in different ways, it appears that schools must change their "one size fits all" mentality. One area that has remained constant over the past century despite numerous social changes is the school calendar. If all students must now achieve high levels of education, schools must accommodate the differences in time needed for various students to acquire the same knowledge and skills. The Commission also noted: "In the school of the future, learning–in the form of high, measurable standards of student performance–must become the fixed goal. Time must become an adjustable resource."[2]

Some children enter school at a disadvantage. Poverty, being a non-native speaker, attending under-funded schools, and summer learning loss are often cited as reasons why some children fail to achieve high standards of learning.[3] Despite these challenges, though, it is argued that all students need to achieve to high levels in order to compete in an increasingly global economy. To improve academic outcomes, many educators, administrators, and others have been searching for new ideas that will encourage student achievement. One possibility that has waxed and waned over the last 100 years is year round education.

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Although the name suggests that students never get a break from being in classrooms, year round schools do not require an increase in the number of mandatory days of attendance. Instead, several mini-vacations are scheduled throughout the year, usually with a three to six-week break in the summer instead of a long three-month summer vacation. Also, optional days are often added during the vacations to form a block of added instruction termed "intersessions," where students who would benefit from remediation or acceleration can receive extra help. Intersessions can add as many as 15 to 60 extra days to the school calendar and are often well attended when a school chooses to institute them.[4]

In addition to entering school at a disadvantage, students on a traditional schedule who experience difficulties must often wait an entire school year to receive remediation through summer school. Advocates for year round schooling, such as Charles Ballinger,[5] argue that it makes no sense to have a struggling student flounder during the entire year when a year round calendar with intersessions can offer quick and frequent remediation. For some schools, adopting a year round calendar has reduced student drop-out rates and increased student achievement.[6]

This study examines the learning differences of students in a year round versus an academic year program. Specifically, it addresses the effects of a year round calendar not only on general education students, but also on children in poverty. Does a year round calendar curb summer learning loss that many children in poverty experience? What are the differences in cognitive outcomes for students in a year round program and those in a regular, academic year program? These questions are addressed using data from an elementary school in the Southeast. First, the literature is reviewed, and the methodology is discussed. Then the study results and findings are presented. The final sections include conclusions and implications for practice and research.

Review of the Literature

Students' forgetting information over the summer is a frequent reason cited for instituting a year round program.[7] Although there is some disagreement about how serious the loss of learning is during the summer, most researchers acknowledge the phenomenon and believe it is a problem.[8] In fact, summer learning loss can be particularly detrimental to disadvantaged students, who lose significantly more knowledge than their middle-class and upper-class peers.[9]

After describing in detail studies on summer learning loss, Debra Viadero (1994) concluded: "While learning slows down for all students when school is out, a small but growing number of studies shows that it practically grinds to a halt for those who come from disadvantaged homes."[10] To support her claim, Viadero cited a 1972 study where Barbara Heyns, a sociology professor at New York University, tracked 3,000 sixth and seventh-graders for two years in Atlanta. After controlling for socioeconomic status and interviewing 500 students on how they spent their summers, Heyns compared May and October standardized test scores. She found that although learning slowed over the summer, advantaged students made gains over the summer while disadvantaged students gained no additional learning or lost learning. Poor children tended to narrow the learning gap during the school year, but the gap between poor and wealthy students widened again over the summer.

In 1982, Doris Entwistle, Karl Alexander, and Linda Steffel Olson began a longitudinal study of 790 Baltimore students, beginning in

first grade and continuing through high school graduation and beyond. In this study, Entwistle, Alexander, and Olson determined that low socioeconomic students entered the first grade earning lower scores on California Achievement Tests than high socioeconomic students, but both groups learned at the same rate during the school months. During the first grade, students from low socioeconomic families gained 57 points in reading and 49 in math. Similarly, first-grade students from families of high socioeconomic status gained 61points in reading and 45 points in math during the year. However, summers tended to produce an achievement gap that adversely affected low socioeconomic children. The summer after the first grade, children from high-income families continued to improve academically with an increase of 15 points in reading and 9 points in math, but children from low-income families lost 4 points in reading and 5 points in math. Entwistle, Alexander, and Olson attributed this difference to the activities that young children from different socioeconomic classes experienced in the summer. Although summer school may seem like a good method for decreasing the learning gap between poor and affluent students, summer schools have actually increased the gap because they have not been specifically designed to meet the needs of low-income children.[11] Describing the children and families in their longitudinal study, Entwistle, Alexander, and Olson concluded that summer activities varied by socioeconomic level, stating:

> In summers when they were in the first few grades, the low-income children were also less likely to go to state or city parks, zoos, science centers, fairs, or carnivals; to take trips and vacations; to borrow books from the library; to play sports; or to take music or dance lessons. In particular, the number of books children read and their use of the public library over the summer both correlate significantly with socioeconomic status.[12]

Since former U.S. Secretary of Education William Bennett's endorsement of a four-quarter year round calendar in 1986, a number of studies have been conducted to compare the academic performance between year round students and students on a traditional calendar. Although the research is inconclusive, several studies have supported increased academic gains for year round students.

After citing about a dozen studies that support academic improvement for year round students, Shields and Oberg [13] outlined their own comparative study of fifth graders in eight urban schools in Utah. From 1990 to 1995, Shields and Oberg analyzed Stanford Achievement Test scores in mathematics, reading, language, science, and social studies of fifth-graders in two single-track, three traditional, and three multi-track schools. After the schools were matched according to socioeconomic status, programs offered, and administrators' tenure and background, the researchers compared the Stanford Achievement Test scores. Using a t-test, Shields and Oberg found significantly higher reading scores among the multi-track students in 1994. The other mean scores (in mathematics, language, science, and social studies) were higher in the year round schools but were not statistically significant. Also, over the six-year period, 21% of the students in the traditional schools scored below their predicted range, while only 4% of the year round students fell below the predicted range. After all of the programs had been stable for two years, 14% of the students in traditional schools were still below their predicted range, whereas only 1% of the year round students were below their predicted range.

Twenty years after adopting a multi-track, year round program (a system where all students are divided into groups and at least one group is always on vacation) in six elementary schools, administrators of the San Diego Unified School District requested an overall review of the year round programs in their district. By the 1991-1992 school year, the district had 25 single-track and 12 multi-track schools in operation. Using scores on the California Tests of Basic Skills (CTBS), Alcorn[14] compared academic performance on seven tests in mathematics, reading, and language for fifth graders. The district objective for fifth grade was that "CTBS median percentile ranks will be maintained or improved on a minimum of 5 of 7 tests."[15] The evaluation included 17 single-track, 15 multi-track, and 73 traditional schools, and the testing period was from 1982 to 1990. During this time, 87% of the year round schools met the district objective (94% of the single-track and 80% of the multi-track schools), but only 71% of the traditional schools met the district's objective.[16] In addition to reviewing fifth-grade test scores, Alcorn studied third and sixth-grade California Assessment Program (CAP) scores in reading and math during the same testing period. In each case, year round schools outperformed traditional schools by three to six percentage points. When Alcorn further divided the CAP scores and reviewed mathematics, language, and reading scores at three testing intervals (one year, three years, and six years), he found that out of 27 comparisons, year round schools outperformed traditional calendar schools 17 times, traditional schools outperformed year round schools one time, and nine times there was no significant difference in scores.[17]

Method

This study employed a quasi-experimental comparative design that investigated the academic outcomes of a voluntary year round program implemented at an elementary school in the Southeast. Data from the 1999-2000 and 2000-2001 school years were compared between year round and traditional calendar students attending the same school. The specific sources analyzed were the Standards of Learning (SOL) test scores in mathematics, English reading and writing, science, and social studies; and Stanford 9 Achievement Test scores in mathematics, language, reading, science, and social studies. The SOL is the state's criterion-referenced test; the Stanford 9 is a nationally norm-referenced test.

The following questions were addressed: (1) What are the characteristics of a year round program and student attendees? (2) Do students who participate in a voluntary year round program perform better on achievement tests than do students in the same school who remain on a traditional, nine-month calendar? (3) Do low-income students in a year round program benefit more than their wealthier peers as measured by achievement test scores? (4) What factors account for differences in achievement test scores, and how do they compare for students on different calendars?

Results and Findings

What are the characteristics of a year round academic program and students who participated in it?

Woodridge Elementary School is an inner-city school in central Virginia that serves children in kindergarten through fourth grade. Many of the children come from low-income homes, with 59% of the children qualifying for free or reduced-price lunch during the 2001-2002 academic year. Prior to the beginning of a new academic year, parents

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are given the option of enrolling their children in the year round or traditional calendar program and may switch from the previous year's calendar if they would like. Approximately one-third of the student body attended school on the year round calendar in its fourth year of implementation.

Since its second year of implementation, the year round calendar has retained a consistent structure. The year round calendar, like the traditional calendar, provides 182 mandatory school days. Different from the traditional calendar, however, are two optional five-day intersessions, one in the fall and one in the late winter. The ten additional intersession days are full days and provide year round students with a total of 192 possible days of instruction. Although attendance for the intersession days is optional, participation has been very high with almost 100% of the third and fourth graders attending at least one intersession day. Many attend all intersession days.

Students enrolled in the year round program begin school at the beginning of August, approximately one month before the traditional students return. Except for a couple of teacher workdays, the students attend classes for eleven weeks and then have a two-week break, where the first week is a scheduled intersession, and the second week is vacation. During intersessions, students review and practice academic skills taught during the year in a camp-like environment that focuses on enjoyable topics like travel or cooking. Because the year round program at Woodridge is single-track, all students and teachers are off school during the week after intersession. The next 13 to 14 weeks are a bit broken up due to Thanksgiving and Christmas holidays, which are the same scheduled days off as the traditional calendar. Again, the two-week break after these weeks of classes consists of the first week being an optional intersession and the second week being a vacation for year round students and staff. The final 13 weeks are interrupted by a week for spring break and end in the middle of June. Because the summer intersession was poorly attended during its first year of operation, the school dropped the third intersession from the successive years. The year round students then have a summer break that is approximately six weeks long before returning to school in early August.

Besides differences in the calendar, the programs and curriculum (excluding intersessions) offered to the year round and traditional students were identical. Both year round and traditional classes used the same curriculum, class sizes were similar with approximately 15 to 18 students in each class, and the teachers' level of education and years of experience were roughly the same.

Student Populations

Before comparing test score data, the year round and traditional calendar populations for the 1999-2000 and 2000-2001 academic years were compared according to the following demographic characteristics: socioeconomic status, gender, ethnicity, special education, gifted education, and family structure. In Table 1, the only area where year round and traditional calendar third-graders were similar was ethnicity. Both groups were composed of approximately one-third Caucasian and two-thirds African-American students. The year round population was composed of 33.3% Caucasian and 60.6% African-American students, and the traditional calendar population included 30.4% Caucasian and 59.8% African-American students. One area of difference between the two groups was socioeconomic status, as measured by the qualification for free and/or reduced-price lunch. Traditional calendar, third-grade students were more likely to qualify for free or reduced-price lunch than their year round peers. With more than a 20 percentage-point difference, only 42.4% of the year round students qualified for free and/or reduced-price lunch, whereas 67.0 % of the traditional students qualified for free and/or reduced-price lunch. Year round students also were more likely to live with two parents than traditional calendar students. While 48.5% of the year round students lived with two parents and 48.5% lived with one parent, only 37.5% of the traditional calendar students lived with two parents whereas 58.0% lived with one parent.

Table 1

Combined 1999-2000 and 2000-2001 Demographics for Third Grade

Indicator	*No.*	*%*	*No.*	*%*	*Total Number of Students*
Indicator of SES	**Neither Free nor Reduced Lunch**		**Free and Reduced Lunch**		
Year-Round	(19)	57.6%	(14)	42.4%	33
Traditional	(37)	33.0%	(75)	67.0%	112
Gender	**Male**		**Female**		
Year-Round	(19)	57.6%	(14)	42.4%	33
Traditional	(52)	46.4%	(60)	53.6%	112
Ethnicity	**Caucasian**		**African-American**		
Year-Round	(11)	33.3%	(20)	60.6%	31*
Traditional	(34)	30.4%	(67)	59.8%	101*
Special Education	**Yes**		**No**		
Year-Round	(3)	9.1%	(30)	90.9%	33
Traditional	(25)	22.3%	(87)	77.7%	112
Gifted	**Yes**		**No**		
Year-Round	(7)	16.1%	(26)	83.9%	33
Traditional	(17)	7.1%	(95)	92.9%	112
Student Lives With	**Both Parents**		**One Parent**		
Year-Round	(16)	48.5%	(16)	48.5%	32*
Traditional	(42)	37.5%	(65)	58.0%	107*

Note: *Ethnicity may not equal 100%. Students classified as "other" comprise the missing students.

The percentages of students qualifying for special education also differed with 22.3% of the traditional calendar population and 9.1% of the year round population receiving services. One reason for the higher percentage of traditional calendar students qualifying for special education is that special-education students in self-contained classrooms are not given a choice between the traditional and year round calendar. However, there is no similar reason to explain why there is more than twice the percentage of gifted students in the year round program than in the traditional calendar program (16.1% and 7.1% respectively).

One final difference between the two populations of third-grade students is gender. In the year round program, there are more boys than girls (57.6% and 42.4% respectively). However, these numbers are almost reversed for the traditional calendar program with girls outnumbering the boys (53.6% and 46.4% respectively).

In many ways, the fourth-grade demographics for year round and traditional calendar students during the 1999-2000 and 2000-2001 school years (Table 2) are similar to the demographics for the third-grade students. Like the third-grade student demographics, more males (54.8%) attended the year round program than females (45.2%), and more females attended the traditional calendar program (52.5%) than males (47.5%). Also, there continued to be somewhat similar percentages for ethnicity between the year round and traditional calendar programs, with about one-third Caucasian and two-thirds African-American students (29.0% and 33.3% Caucasians, and 64.5% and 58.6% African-Americans). Other similarities between the third and fourth grade populations include the differences in special and gifted education. Again, special education percentages were larger for the traditional calendar population, while the gifted education percentages were higher for the year round population. The percentage of year round students qualifying for special education services was 12.9%, and the percentage of traditional calendar students qualifying for special education services was almost twice as large at 25.3%. As stated earlier, the larger percentage of special education students in the traditional program was expected given that students in self-contained special education classes did not have a choice between year round and traditional calendars. However, the gifted population was larger in the year round program than the traditional calendar program with 16.1% of the year round students qualifying for gifted education but only 7.1% of the traditional calendar students qualifying for gifted education.

One key difference between the third and fourth-grade populations for the 1999-2000 and 2000-2001 school years was socioeconomic status as measured by free and reduced-price lunch. Unlike the third-grade population where the year round students were more likely not to qualify for free or reduced-price lunch, the fourth-grade year round students were much more likely than their traditional peers to qualify for free or reduced-price lunch. Of the year round students, 71.0% qualified for free or reduced-price lunch, but only 59.6% of the traditional calendar students qualified for free or reduced-price lunch. Another difference between the third and fourth grade populations was family structure. While the third grade year round students were more likely to live with two parents than traditional calendar students, the fourth grade year round students were quite similar to traditional calendar students in this respect, with 32.3% of the year round students living with two parents and 36.4% of the traditional students living with two parents.

Table 2

Combined 1999-2000 and 2000-2001 Demographics for Fourth Grade

Indicator	*No.*	*%*	*No.*	*%*	*Total Number of Students*
Indicator of Poverty-SES*	**Neither Free nor Reduced Lunch**		**Free and Reduced Lunch**		
Year-Round	(9)	29.0%	(22)	71.0%	31
Traditional	(40)	40.4%	(59)	59.6%	99
Gender	**Male**		**Female**		
Year-Round	(17)	54.8%	(14)	45.2%	31
Traditional	(47)	47.5%	(52)	52.5%	99
Ethnicity	**Caucasian**		**African-American**		
Year-Round	(9)	29.0%	(20)	64.5%	29*
Traditional	(33)	33.3%	(58)	58.6%	91*
Special Education	**Yes**		**No**		
Year-Round	(4)	12.9%	(27)	87.1%	31
Traditional	(25)	25.3%	(74)	74.7%	99
Gifted	**Yes**		**No**		
Year-Round	(5)	16.1%	(26)	83.9%	31
Traditional	(7)	7.1%	(95)	92.9%	99
Student Lives With	**Both Parents**		**One Parent**		
Year-Round	(10)	32.3%	(20)	64.5%	30*
Traditional	(36)	36.4%	(60)	60.6%	96*

Note: *Socioeconomic Status. Numbers may not equal 100%. Students classified as "other" comprise the missing students.

Thus, the differences in populations may affect study findings in important ways when grade levels are considered separately, particularly because of differences in special education and low income populations. However, these variations are moderated somewhat when data are considered across both grade levels, with the exception of special education status, which is higher for children on the traditional calendar.

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Table 3

Compilation of Test Comparisons Between Year-Round and Traditional-Calendar Students

Test	*N*	*Mean*	*Std. Dev.*	*T*	*Sig. (2-tailed)*	*Mean Diff.*
SOL Math						
Year-Round, all	35	431.74	102.43	-2.022	.045	-35.82
Traditional, all	95	395.93	84.48			
SOL History/S.S.						
Year-Round, all	35	428.11	68.35	-2.465	.015	-30.59
Traditional, all	95	397.53	60.61			
SOL History/S.S.						
Year-Round, Always	19	443.21	76.787	-2.942	.004	-46.76
Traditional, Always	82	396.45	58.755			
SOL Math						
Year-Round, Always	19	452.21	112.011	-2.293	.024	-51.58
Traditional, Always	82	400.63	82.155			
SOL English						
Year-Round, Always	19	432.53	99.519	-1.895	.061	-33.59
Traditional, Always	82	398.94	60.998			
SOL Math						
Year-Round, H. SES	19	471.74	103.66	1.983	.053	52.42
Traditional, H. SES	35	419.31	86.43			
SOL History/S.S.						
Year-Round, H. SES	19	455.84	71.68	1.905	.062	38.84
Traditional, H. SES	35	417.00	71.47			
Stanford 9 Math						
Year-Round, L. SES	21	594.19	36.90	2.081	.041	17.44
Traditional, L. SES	53	576.75	30.62			
Stanford 9 Math						
Year-Round, Males	16	597.56	35.40	1.839	.071	19.23
Traditional, Males	42	578.33	35.66			
SOL History/S.S.						
Year-Round Females	16	444.81	73.35	2.181	.033	39.85
Traditional Females	52	404.96	60.85			
SOL Math						
Year-Round, White	12	490.42	1-7.85	2.241	.015	-30.59
Traditional, White	30	416.73	91.48			
SOL Science						
Year-Round, White	12	471.33	80.41	1.822	.076	44.95
Traditional, White	30	426.38	68.24			
SOL English						
Year-Round, White	12	464.67	130.70	1.705	.096	27.84
Traditional, White	30	417.20	71.30			

Table 3 (continued)

Compilation of Test Comparisons Between Year-Round and Traditional-Calendar Students

Test	*N*	*Mean*	*Std. Dev.*	*T*	*Sig. (2-tailed)*	*Mean Diff.*
Stanford 9 S.S.						
Year-Round, White	9	610.78	53.60	1.907	.065	13.69
Traditional, White	28	584.68	28.33			
Stanford 9 Reading						
Year-Round, Sp. Ed.	5	558.00	23.47	-2.346	.030	17.32
Traditional, Sp. Ed.	16	598.63	36.05			

Comparisons Between Programs

For this study, scaled scores on third-grade Virginia SOL tests in English reading and writing, math, science, and history/social studies and scaled scores on the fourth-grade Stanford 9 Achievement Tests in reading, math, language, science, and social studies were compared between the year round and the traditional calendar students. The descriptive statistics reported included means and standard deviations. A t-test with a $p \leq .05$ was also used to determine the likelihood of differences being due to chance. However, because scores from the entire population, rather than a random sample, were analyzed, any difference is considered to be educationally significant.

In addition to comparing the groups as a whole, the following subgroups were compared:

- students who attended the year round program each year since the program's inception in 1998 versus students who never attended school on a traditional calendar;
- wealthy versus poor students;
- groups based on individual characteristics disaggregated by gender, ethnicity, special education and gifted education status; and
- children in single versus two parent families.

Findings

The first part of the analysis compared the Stanford 9 and SOL test scores for all year round and traditional calendar students without concern for demographic make-up. As shown in Table 3, at the $p \leq .05$ significance level, year round students outperformed their traditional calendar peers on SOL mathematics and history/social science tests. In mathematics, the mean difference was significant ($t = -2.022$, $p \leq .045$). Year round students outperformed their traditional peers by 35.82 points with a year round mean of 431.74 and a traditional mean of 395.93. Also in history/social science, the mean difference was significant ($t = -2.465$, $p \leq .015$). Year round students again outperformed their traditional peers by 30.59 points with a year round mean of 428.11 and a traditional mean of 397.53.

In addition to these overall comparisons, scores for students who had been in the year round program since its inception in the fall of 1998 were compared with the scores of students who had never participated in the year round program. In this comparison, students who had attended year round since its inception had higher mean scores for all SOL sub-tests and for every Stanford 9 sub-test except science. There were significant SOL test score mean differences favoring year round for history/social science ($t = 2.942$, $p \leq .004$) and mathematics ($t = -2.293$, $p \leq .024$), and year round students almost met the $p \leq .05$ significance level requirement for English reading and writing ($t = -1.895$, $p = .061$). For the SOL history/social science test, the year round students outperformed their traditional calendar peers by 46.76 points with a year round mean of 443.21 and a traditional mean of 396.45. For the SOL mathematics test, the year round students outperformed the traditional calendar students by 51.58 points with a year round mean of 452.21 and a traditional mean of 400.63. Finally, for the SOL English reading and writing test, the year round students again outperformed the traditional calendar students by 33.59 points with a year round mean of 432.53 and a traditional mean of 398.94.

The second part of the analysis compared the Stanford 9 and SOL test scores for poor and affluent year round and traditional students (as measured by qualifying for free and/or reduced-priced lunches). Affluent year round students came close to outperforming their traditional calendar peers on the SOL mathematics ($t = 1.983$, $p = .053$) and history/social science ($t = 1.905$, $p \leq .062$) tests. Year round students scored higher on the SOL mathematics test than their traditional calendar peers by 52.42 points with a year round mean of 471.74 and a traditional mean of 419.31. On the history/social science SOL test, year round students again scored higher than the traditional students by 38.84 points with a year round mean of 455.84 and a traditional mean of 417.00. For those in poverty, year round students significantly ($t = 2.081$, $p \leq .041$) outperformed traditional calendar students on the Stanford 9 mathematics tests. Year round students outperformed traditional students by 17.44 points with a year round mean of 594.19 and a traditional mean of 576.75.

In addition to these comparisons, year round and traditional high and low socioeconomic (as defined by the qualification for free lunches) students' test scores were compared within each group: traditional and year round calendar. Table 4 lists the significant differences on the Stanford 9 sub-test comparisons. Overall, year round high and low socioeconomic students had significant mean differences in only two areas, reading ($t = 2.616$, $p \leq .016$) and science ($t = 2.628$, $p \leq .013$), whereas traditional high and low socioeconomic students had significant mean differences on all of the Stanford 9 sub-tests. The most noticeable comparison that indicates that the year round test score gap between high and low socioeconomic students was smaller than the traditional test score gap between high and low socioeconomic students was on the Stanford 9 mathematics comparison. While the traditional high and low socioeconomic students had significantly different means on the Stanford 9 mathematics sub-test ($t = 4.030$, $p \leq .000$) with a mean difference of 36.21 points favoring high

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Table 4

Compilation of Stanford 9 SES Comparisons

Test	*N*	*Mean*	*Std. Dev.*	*T*	*Sig. (2-tailed)*	*Mean Diff.*
Stanford 9 Reading						
Y-R High SES	8	643.75	59.708	2.616	.016	48.95
Y-R Low SES	15	594.80	30.957			
Stanford 9 Science						
Y-R High SES	19	449.16	77.423	2.628	.013	63.62
Y-R Low SES	13	385.54	48.117			
Stanford 9 Reading						
Trad. High SES	34	631.97	42.386	4.160	.000	32.69
Trad. Low SES	47	599.28	28.351			
Stanford 9 Math						
Trad. High SES	34	609.82	50.863	4.030	.000	36.21
Trad. Low SES	47	573.62	29.640			
Stanford 9 Lang.						
Trad. High SES	34	597.53	41.741	3.765	.000	26.85
Trad. Low SES	47	570.68	21.742			
Stanford 9 Science						
Trad. High SES	34	640.91	39.463	4.925	.000	37.06
Trad. Low SES	47	603.85	28.311			
Stanford 9 S./S.						
Trad. High SES	34	597.53	27.324	3.695	.000	23.00
Trad. Low SES	47	574.53	27.871			

socioeconomic students, the year round high and low socioeconomic students did not have significantly different means on the Stanford 9 mathematics sub-test ($t = .284$, $p \leq .779$). High and low socioeconomic year round students had a mean difference of only 5.38 points on the Stanford 9 mathematics test.

Given the test comparisons for year round and traditional high and low socioeconomic students, the year round calendar may have helped poorer students academically perform closer to the same level as their wealthier peers in mathematics as measured by the Stanford 9 mathematics sub-test. For the tests where the year round mean differences were larger than the traditional mean differences, the year round mean differences were less likely to be significant ($p \leq .05$), another indicator that the test-score gap between affluent and poor students was less significant for year round students.

The last part of the analysis compared Stanford 9 and SOL scores for year round and traditional calendar students based on various demographic characteristics. First, gender was compared. For males, none of the Stanford 9 or SOL tests had a significant mean difference, although Stanford 9 mathematics scores for year round students were close ($t = 1.839$, $p = .071$). Year round males scored an average of 19.23 points higher on the mathematics Stanford 9 than traditional calendar students with a year round mean of 597.56 and a traditional mean of 578.33. For females, SOL history/social science year round scores were significantly higher than traditional calendar students' scores ($t = 2.181$, $p \leq .033$). Year round females scored an average of 39.85 points higher than traditional females did. The year round mean was 444.81, and the traditional mean was 404.96).

Year round Caucasian students had a significant positive mean difference on the SOL mathematics test ($t = 2.241$, $p \leq .031$) and came close to the $p \leq .05$ significance level on the SOL science ($t = 1.822$, $p = .076$) and English ($t = 1.705$, $p = .096$) tests and on the Stanford 9 social science test ($t = 1.907$, $p = .065$). Year round Caucasian students outperformed their traditional peers on the SOL mathematics test by 73.68 points with a year round mean of 490.42 and a traditional mean of 416.73. On the SOL science test, year round Caucasian students outperformed their traditional peers by 44.95 points with a year round mean of 471.33 and a traditional mean of 426.38. On the SOL English reading and writing test, year round Caucasian students outperformed traditional Caucasian students by 47.47 points with a year round mean of 464.67 and a traditional mean of 417.20. On the Stanford 9 social science test, year round Caucasian students outperformed traditional Caucasian students by 26.10 points with a year round mean of 610.78 and a traditional mean of 584.68. For African-Americans, there were no significant mean differences for any of the Stanford 9 or SOL tests. Whether or not a student lived with one or two parents did not seem to affect test scores. There were no significant mean differences for any of the Stanford 9 or SOL tests.

For special education, there was a significant mean difference between year round and traditional students' Stanford 9 reading scores ($t = -2.346$, $p \leq .030$). Unlike the other mean differences, this difference favored traditional calendar students. Traditional special education students outperformed the year round special education students by 40.63 points with a traditional mean of 598.63 and a year round mean of 558.00. When interpreting the special education t-tests, it is important to take into account that the special-education populations were very small (only seven third and fourth grade year round special education students in two years), that this study did not separate students based on types of disabilities, and that self-contained special education students could not choose to participate in the year round program. Finally, being gifted did not seem to affect test scores. There were no significant mean differences for any of the Stanford 9 or SOL tests.

Conclusions

Before drawing conclusions from the data, it is important to reiterate that it is impossible to control all intervening variables. Even though several variables were controlled (socioeconomic, gender, ethnicity, special education, giftedness, and family structure), there may be other variables that account for the differences in year round and traditional calendar test scores. Despite the possibility of intervening variables, some conclusions can still be suggested. As a whole, the year round program at Woodridge seems to have had a positive academic effect on mathematics and history/social science, as measured by t-tests of the difference in means on Stanford 9 and SOL achievement tests. For mathematics, there was a significant mean difference ($p \leq .05$) favoring year round students in three different SOL test comparisons (all year round third graders, third graders who have been in the year round program since its inception, and Caucasians). Importantly, there was a significant mean difference ($p \leq .05$) favoring year round students on the Stanford 9 mathematics test for low socioeconomic students. Additionally, for the general population, twice the year round students came close to outperforming traditional students at the $p \leq .05$ level on the mathematics tests. On the SOL mathematics test, high socioeconomic year round students outperformed traditional students at the $p \leq .053$ level, and on the Stanford 9 mathematics test, year round males outperformed traditional males at the $p \leq .071$ level.

On five different history/social science tests, year round students outperformed traditional students at or near the $p \leq .05$ level. For the SOL history/social science tests, there was a significant mean difference ($p \leq .05$) favoring year round students in three different comparisons (all year round third graders, third graders who have been in the year round program since its inception, and females). In two other history/social science tests, the mean difference favoring year round students was close but not at $p \leq .05$. High socioeconomic year round students outperformed traditional high socioeconomic students on the SOL history/social science test with a $p = .062$. Caucasian year round students outperformed Caucasian traditional calendar students on the Stanford 9 social science test at the $p = .065$ level.

Although there were a few other test comparisons that favored year round students near the $p \leq .05$ level (SOL science and English for Caucasians and SOL English for students in the year round program since its inception), mathematics and history/social science were the tests that continually showed significant year round results.

It is interesting to note that traditional students outperformed year round students only once at the $p \leq .05$ level. This outcome in favor of the traditional special-education students occurred on the Stanford 9 reading sub-test. Although it appeared on the surface that Woodridge's year round program had a negative effect on reading for special education students (as measured by the Stanford 9), there were a few possible reasons why this result may not have been due to the year round program itself. First, the special education populations were very small. Second, there was no differentiation between different exceptionality in this study. Third, self-contained students did not have the choice to participate in the year round program. Also, it is important to emphasize that this result is inconsistent with the other comparisons done in the study.

Finally, the test-score gap between poor and more affluent year round students appears to be closing with year round schooling. This is a critical finding. When the test scores of high and low socioeconomic students were compared according to year round and traditional calendars, the year round students had fewer significant mean differences between the poor and more affluent students' scores within their group. What was most noticeable was the difference in Stanford 9 mathematics scores. For the year round students, there was only a 5.38-point difference in the average scores between the more affluent and the poor students, and the t-score was not even close to significance ($t = .284$, $p = .779$). Conversely, the traditional students had a 36.21 mean difference between the poor and wealthier students, and that difference was significant ($t = 4.030$, $p \leq .001$).

Except for two cases, comparisons that were statistically significant at the $p \leq .05$ level were SOL test comparisons. These results seem logical given that Virginia's SOL tests are supposed to be aligned with the curriculum being taught in Virginia's schools. Stanford 9 tests are assessments given all over the country and are not necessarily accurate tools for assessing the specifics of what is being taught in a particular school.

Implications for Practice and Research

Given that schools are becoming increasingly accountable for student learning by state and federal governments, it is becoming increasingly important that effective investments in interventions that hold promise of raising the level and distribution of outcomes for all students be identified and targeted. Year round education is one possible option for increasing student achievement.

For Woodridge Elementary School, the modified year round calendar that has been implemented appears to be having a positive academic effect on some students though not all. What is most significant is the potential difference year round education may make in whether students pass or fail state-mandated tests. If an elementary-school student fails Virginia's SOL tests, he or she may be required to repeat the same grade. Beginning in 2004, if a high school student fails any of the six mandated SOL tests, he or she will not graduate.[18]

When considering the strong consequences for failing Virginia's SOL tests, the test score means for year round and traditional calendar students deserve even more attention. On the SOL tests, a scaled score of 400 or better is passing, but scaled scores below 400 are failing. Given this fact, it is important to notice that when all third-graders were grouped together, the year round students' mean for mathematics was 431.74 (passing), but the traditional calendar students' mean for mathematics was 395.93 (failing). Likewise, the SOL history/social science means for all third-graders indicated the same situation. The SOL history/social science mean for all year round third-graders was 428.11 (passing), but the mean for all traditional calendar third-graders

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was 397.53 (failing). Again, the same situation occurred with year round students who had attended the year round program since its inception and traditional calendar students who had never attended the program. The history/social science mean for students who had attended the year round program since its inception was 443.21 (passing), but the history/social science mean for students who had never attended the year round program was 396.45 (failing). Although means do not necessarily give an accurate picture of individual performance, and it is inappropriate to state that year round education students, on average, passed more of the SOL tests, these mean differences shouldn't be ignored and should be further investigated. If it is determined that year round education does, in fact, encourage more students to pass required achievement tests, then Woodridge Elementary may want to consider keeping, and perhaps expanding, its year round program.

This research will add to the current knowledge base on year round education, including the comparisons of year round and traditional calendar students within the same school and its comparisons of various sub-populations. In some ways the outcomes of this research were consistent with previous findings from other studies. For instance, Alcorn,[19] Consolie,[20] Curry, Washington, and Zyskowski,[21] Gandara and Fish,[22] Haenn,[23] Prohm and Baenen,[24] and Shield and Oberg[25] all found positive gains for year round students in mathematics. History has not been tested nearly as often as reading and mathematics, but Shield and Oberg also found higher history test scores for year round students.[26] Conversely, reading seems to be one of the most often cited areas of increased means for year round students.[27] Although two of the English reading and writing SOL test comparisons favoring year round students in this study came close to being significant at the $p \leq .05$ level, English was not the most often found area showing significant mean differences.

Given this study's unique design of comparing various traditional calendar and year round populations within the same school, it should add to the current body of knowledge on year round education.

Endnotes

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